Attorney's Docket No.: JYG147USA

TRANSMITTAL LETTER TO THE U.S. ELECTED OFFICE (EO/US) - ENTRY INTO NATIONAL STAGE UNDER 35 USC 371

PCT/GB99/03097	17 September 1999	18 September 1998
International Application No.	International Filing Date	Priority Date Claimed

PHOTOSENSITIVE PLASTICS FILMS AND INFORMATION STORAGE DEVICES
Title of Invention

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Box PCT
Assistant Commissioner for Patents
Washington, DC 20231
Attn: EO/US

Sir:

Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 USC 371:

(1) This express request to immediately begin national examination procedures (35 USC 371(f)).

(2) A copy of the cover sheet for the published International Application along with a copy of the specification as filed: 10 pages, including 2 pages of claims and a copy of the 3 page International Search Report.

(3) a copy of the 4 page Request form.

(4) a first Preliminary Amendment for entry prior to calculation of the filing fees.

Express Mail No. ET033649028US

(5) our check in the amount of $860.00, covering the basic national fee as set forth in 37 CFR 1.492(a)(5) and based on the first Preliminary Amendment (5 total claims; 1 independent; and no multiple dependent)

(6) A Second Preliminary Amendment.

(7) Our check in the amount of $80.00, covering the extra claim fees after entry of the second Preliminary Amendment (17 total claims; 4 independent; and no multiple dependent).

(8) an eight (8) page executed Combined Declaration and Power of Attorney.

Copies of the following miscellaneous items are also enclosed:

(8) Copy of the 3 page Demand for International Preliminary Examination.

(9) Copy of the 4 page International Preliminary Examination Report.

(10) Copy of the 1 page Notification of the Recording of a Change.

Please charge any additional fees which may be required to effect entry into the National Phase and credit any overpayment to Deposit Account No. 08-3040.

Please direct all communications concerning this application to the undersigned.

Respectfully submitted,

HOWSON AND HOWSON
Attorneys for the Applicants

By _____

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09/787344

JC02 Rec'd PCT/PTO 16 MAR 2001

PTO/SB/06 (08-00)
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PATENT APPLICATION FEE DETERMINATION RECORD

Application or Docket Number: JYG147USA

CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED		(Column 2) NUMBER EXTRA	SMALL ENTITY RATE	SMALL ENTITY FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY FEE
BASIC FEE (37 CFR 1.16(a))					$ ____	OR		$860
TOTAL CLAIMS (37 CFR 1.16(c))	5	minus 20 =	* 0	x $____ =		OR	x $ 18 =	0
INDEPENDENT CLAIMS (37 CFR 1.16(b))	1	minus 3 =	* 0	x ____ =		OR	x 80 =	0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))				+ ____ =		OR	+270 =	0
				TOTAL		OR	TOTAL	860

* If the difference in column 1 is less then zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
Total (37 CFR 1.16(c))	* 5	Minus	** 20	= 0	x $____ =		OR	x $ 18 =	0
Independent (37 CFR 1.16(b))	* 1	Minus	*** 3	= 0	x ____ =		OR	x 80 =	0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ ____ =		OR	+270 =	0
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	0

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
Total (37 CFR 1.16(c))	* 17	Minus	** 20	= 0	x $____ =		OR	x $ 18 =	0
Independent (37 CFR 1.16(b))	* 4	Minus	*** 3	= 1	x ____ =		OR	x 80 =	80
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ ____ =		OR	+ 270 =	0
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	80

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
Total (37 CFR 1.16(c))	*	Minus	**	=	x $____ =		OR	x $____ =	
Independent (37 CFR 1.16(b))	*	Minus	***	=	x ____ =		OR	x ____ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ ____ =		OR	+ ____ =	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

JYG147USA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of	) Group Art Unit:
Michael Hawkins et al	) Examiner:
Appln. No.	)
Filed: Herewith	)
For: PHOTOSENSITIVE PLASTICS FILMS AND INFORMATION STORAGE DEVICES	) March 16, 2001

Assistant Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

Please amend the application as set forth below.

In the Claims

Cancel claims 4 and 6-10 without prejudice.

REMARKS

After entry of this preliminary amendment, the pending claims are claims 1-3, 5 and 11. Claims 4 and 6-10 are cancelled. No new matter is introduced by this preliminary amendment.

Applicants respectfully request that this preliminary amendment be entered prior to calculating the filing fees.

Express Mail No. ET033604902 8US

The Director of the U. S. Patent and Trademark Office is hereby authorized to charge any deficiency in any fees due with the filing of this paper or credit any overpayment in any fees to Deposit Account No. 08-3040.

Respectfully submitted,

HOWSON AND HOWSON
Attorneys for Applicant

By ____________________

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JYG147USA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of	) Group Art Unit:
	)
Michael Hawkins et al	) Examiner:
	)
Appln. No.	)
	)
Filed: Herewith	)
	)
For: PHOTOSENSITIVE PLASTICS FILMS AND INFORMATION STORAGE DEVICES	) March 16, 2001))

Assistant Commissioner for Patents
Washington, DC 20231

SECOND PRELIMINARY AMENDMENT

Sir:

Please amend the application as follows.

In the Specification

Please enter the attached Abstract of the Disclosure on the attached page as new page 11.

In the Claims

Amend claims 5 and 11 as follows.

5. (Amended) A film as claimed in claim 12, wherein the polymer is polystyrene.

Express Mail No. ET033649028US

11. (Amended) An information storage device as claimed in claim 17, wherein the mask is perforated with holes of diameter 1 to 5mm and has a thickness of 0.5 to 2.5 times the diameter of the holes.

Add new claims 12-23 as follows.

12. A film according to claim 1, wherein the photosensitive organic compound is dispersed at molecular level in a coating of a polymer which is compatible with the compound but does not reach with it nor cause it to crystallise nor substantially absorb light of wavelengths to which the photosensitive compound is sensitive.

13. A film according to claim 1, which bears the coating containing a photosensitive organic compound on one side and is metallised on its reverse side.

14. A film according to claim 1, wherein the filler is a white pigment.

15. A film according to claim 1, which has a diffuse reflectivity of at least 85% and a specular reflectivity of no more than 3%, based on the reflectivity of a standard barium sulphate plate.

16. A film according to claim 1, containing from 0.5 to 2% by weight based on the coating of a non-photosensitive, light-absorbing compound.

17. An information storage device comprising in combination:

(a) a plastics film filled with a filler and having diffuse reflective properties, the film bearing a coating which contains a photosensitive organic compound; and

(b) a perforated mask disposed on a coating-bearing side of the film.

18. A laminate comprising a plastics film filled with titania filler and having a diffuse reflectivity of at least 85% and a specular reflectivity of no more than 3%, based on the reflectivity of a standard barium sulphate plate, and a polystyrene coating containing a photochromic fulgide.

19. A method for the manufacture of a photosensitive plastics film filled with a filler and having diffuse reflective properties, the film bearing a polymeric coating which contains a photosensitive organic compound, wherein the polymer and photosensitive compound are dissolved in a solvent and the composition so formed is applied to the film by a printing technique.

20. A method according to claim 19, wherein the composition is applied to the film by gravure printing.

21. A method according to claim 19, wherein the side of the film not coated by the composition is metallised prior to said coating step.

22. A method according to claim 19, wherein the composition is applied to the film in the form of spots.

23. A method according to claim 22, wherein the composition is applied to the film as an array of circular spots disposed in groups, with the groups being disposed in a regular square array.

REMARKS

Upon entry of this preliminary amendment, the claims pending are claims 1-3, 5, and 11-23. New claims 12-18 are supported throughout the specification and by original claims 4, and 6-10, respectively, and have eliminated multiple dependencies. New claims 19-21 are supported on page 4, lines 27-32, of the application. New claim 22 is supported on page 5, lines 24-28, of the application.

New claim 23 is supported on page 6, lines 27-33, of the application. No new matter is introduced by this preliminary amendment. A copy of amended claims 5 and 11 showing deletions is attached as Appendix A. A clean copy of all of the pending claims is attached as Appendix B.

The attached Abstract of the Disclosure is supported throughout the specification.

Applicants respectfully request consideration of the amended pending claims.

The Director of the U. S. Patent and Trademark Office is hereby authorized to charge any deficiency in any fees due with the filing of this paper or credit any overpayment in any fees paid on the filing, or during prosecution of this application to Deposit Account No. 08-3040.

Respectfully submitted,

HOWSON AND HOWSON
Attorneys for Applicant

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APPENDIX A - AMENDED CLAIMS

5. (Amended) A film as claimed in claim [4] 12, wherein the polymer is polystyrene.

11. (Amended) An information storage device as claimed in claim [10] 17, wherein the mask is perforated with holes of diameter 1 to 5mm and has a thickness of 0.5 to 2.5 times the diameter of the holes.

APPENDIX A - PENDING CLAIMS

1. A plastics film filled with a filler and having diffuse reflective properties, the film bearing a coating which contains a photosensitive organic compound.

2. A film as claimed in claim 1, wherein the photosensitive organic compound is a photochromic compound.

3. A film as claimed in claim 2, wherein the photochromic compound is a fulgide or diarylethene.

5. A film as claimed in claim 12, wherein the polymer is polystyrene.

11. An information storage device as claimed in claim 17, wherein the mask is perforated with holes of diameter 1 to 5mm and has a thickness of 0.5 to 2.5 times the diameter of the holes.

12. A film according to claim 1, wherein the photosensitive organic compound is dispersed at molecular level in a coating of a polymer which is compatible with the compound but does not reach with it nor cause it to crystallise nor substantially absorb light of wavelengths to which the photosensitive compound is sensitive.

13. A film according to claim 1, which bears the coating containing a photosensitive organic compound on one side and is metallised on its reverse side.

14. A film according to claim 1, wherein the filler is a white pigment.

15. A film according to claim 1, which has a diffuse reflectivity of at least 85% and a specular reflectivity of no more than 3%, based on the reflectivity of a standard barium sulphate plate.

16. A film according to claim 1, containing from 0.5 to 2% by weight based on the coating of a non-photosensitive, light-absorbing compound.

17. An information storage device comprising in combination:

(a) a plastics film filled with a filler and having diffuse reflective properties, the film bearing a coating which contains a photosensitive organic compound; and

(b) a perforated mask disposed on a coating-bearing side of the film.

18. A laminate comprising a plastics film filled with titania filler and having a diffuse reflectivity of at least 85% and a specular reflectivity of no more than 3%, based on the reflectivity of a standard barium sulphate plate, and a polystyrene coating containing a photochromic fulgide.

19. A method for the manufacture of a photosensitive plastics film filled with a filler and having diffuse reflective properties, the film bearing a polymeric coating which contains a photosensitive organic compound, wherein the polymer and photosensitive compound are dissolved in a solvent and the composition so formed is applied to the film by a printing technique.

20. A method according to claim 19, wherein the composition is applied to the film by gravure printing.

21. A method according to claim 19, wherein the side of the film not coated by the composition is metallised prior to said coating step.

22. A method according to claim 19, wherein the composition is applied to the film in the form of spots.

23. A method according to claim 22, wherein the composition is applied to the film as an array of circular spots disposed in groups, with the groups being disposed in a regular square array.

PHOTOSENSITIVE PLASTICS FILMS AND INFORMATION STORAGE DEVICES

Field of the invention

This invention relates to polymeric films comprising photosensitive, particularly photochromic, organic compounds, which films exhibit a high response to exposure to electromagnetic radiation, particularly visible light, and to information storage devices incorporating such films.

As used herein, the unqualified expression "light" refers generally to electromagnetic radiation in the UV-visible region, and "colour" refers generally to the spectral properties within the UV-visible region of light or of an article.

Background art

WO-A-94/24785 discloses an information storage device comprising a photosensitive film for application to a small region of a monitor such as a television screen. The photosensitive material in the film may be photochromic. The photosensitive film may be metallised with gold or silver on its reverse side, both to guard the photosensitive material from light falling on the reverse side of the film, and to reflect light falling on the obverse side of the film but passing through the film without interacting with the photosensitive material back towards the photosensitive material. The film may be provided on its obverse side with a lens to focus light falling on the film and thus to yield a sharp image.

In some information-collecting applications, an image consisting of discrete spots (as opposed to a continuous image) may be found suitable. In such a case the obverse side of the film may advantageously be provided with a perforated mask, for example of cardboard, as focusing device instead of a plastics lens. The mask may be markedly thicker than the film, so that the photosensitive material is activated only by light falling on the storage device at

a near-perpendicular angle to the film. The desirability of employing a photosensitive material of high sensitivity will be appreciated, namely in order that a large colour difference between exposed and unexposed areas can be obtained in a short exposure time. However, there may be problems in reading the information which has been collected in a storage device of such construction. The reading step involves illumination with light of wavelength characteristic of the photosensitive material (unexposed or exposed) and analysis of the reflected light. If the photosensitive film is unreflective (either because the film has no backing or because the film has light-absorbent properties), the amount of reflected light is low. If the film is highly reflective, for example if it is metallised on its reverse side, the amount of reflected light is so great that it is difficult to distinguish between exposed and unexposed areas. The present invention addresses such problems.

Disclosure of the invention

According to the invention, there is provided a plastics film filled with a filler and having diffuse reflective properties, the film bearing a coating which contains a photosensitive organic compound.

The plastics film may be of conventional polymeric material such as regenerated cellulose, cellulose acetate or polyamide, although a polyester such as poly(ethylene terephthalate) may be preferred. The polymer desirably exhibits high transparency at relevant wavelengths.

The filler is preferably a pigment, more preferably a white pigment. Titanium dioxide (titania) is a particularly preferred white pigment for use when the photosensitive compound is chosen to react on exposure to visible light, because of its good diffuse reflective properties to visible light. Other common white pigments such as barium sulphate tend to confer a relatively high degree of specular

reflection to visible light on a filled film, and they are accordingly less preferred. On the other hand, if the compound is chosen to react on exposure to UV light, barium sulphate may be preferred to titania, because barium sulphate exhibits better diffuse reflectivity than titania to UV light. Other kinds of filler, for example polymer beads, may be employed. If an aerated or microvoided polymeric film is employed, the filler is generally a gas such as air. A decisive factor is that the refractive index of the filler particles (or voids) should differ from that of the polymer of the film so as to confer diffuse reflective properties on the film. The size and shape of the particles (or voids) may also be influential. The nature of the filler and filled film are not thought to affect the photochemistry of the photosensitive compound and accordingly are not thought to modify the nature of the information collecting step.

The diffuse and specular reflective properties of a film may be measured by conventional techniques, for example using a UV-visible spectrometer equipped with an integrating sphere for reflectance measurement and an optional light trap for removal of the specularly-reflected component. At relevant wavelengths, the plastics film preferably exhibits a diffuse reflectivity of at least 80%, more preferably at least 85%, and a specular reflectivity of no more than 5%, preferably of no more than 3% (all percentages being based on the reflectivity of a standard barium sulphate plate).

The coating may comprise more than one photosensitive organic compound. The photosensitive compound is preferably a photochromic compound. Photochromic organic compounds are known and include the photochromic fulgides and diarylethenes. Such compounds change colour when exposed to light whose wavelength corresponds to a spectral absorption peak of the compound. This colour change is the result of isomerisation, and it is reversed if the isomerised compound is exposed to light whose wavelength corresponds to a

spectral absorption peak of the isomerised compound. The efficiency of the isomerisation reaction differs for different compounds, depending on the efficiency with which the molecule absorbs photons and on the efficiency with which the molecule isomerises after absorption of a photon. The invention preferably employs a photochromic compound which reacts with a high degree of efficiency, most preferably in both the forward direction and the reverse direction. The photochromic compound preferably has a low tendency to thermochromism (colour change resulting from heat-induced isomerisation). The photochromic compound preferably strongly absorbs light from one or more of the RGB guns in a conventional television. A preferred compound is the fulgide Aberchrome 670 (Trade Mark of Aberchromics Ltd.) (CAS Registry No. 94856-25-4), which exhibits a rapid colour change (is rapidly bleached) by exposure to light of wavelength around 530 nm (corresponding to the green gun).

The coating preferably comprises a polymer in which the photosensitive compound is dispersed at molecular level. In general, any polymer compatible with the compound may be used. It will be appreciated that polymers which absorb light at relevant wavelengths, or which may react with the compound, or in which the compound may crystallise, will in general be unsuitable. An olefinic polymer such as polystyrene may generally be found suitable. The polymer of the coating desirably exhibits high transparency at relevant wavelengths. Coating compositions may be made for example by dissolving the polymer and compound in a solvent, and such compositions may be applied to the film by conventional techniques such as gravure printing or other printing methods.

The film is preferably metallised on its reverse side. Metallisation serves primarily to guard the photosensitive compound from light falling on the reverse side of the film and secondarily to provide a reflective surface from which light passing through the film can be reflected back towards

the photosensitive compound through the diffuse reflective film in the information collecting step. The efficiency of light collection may in consequence be increased by some 10 or 20 percent.

The invention further provides an information storage device which comprises in combination the film described hereinabove and a perforated mask disposed on the coating-bearing side of the film. The mask may for example be perforated with holes of from 1 to 5 mm diameter. The thickness of the mask may for example be from 0.5 times to 2.5 times the diameter of the holes.

An information storage device according to the invention has the advantage that instrumental measurement of the colour of the film is markedly easier than in a device which incorporates a film which exhibits highly specular reflective properties or which exhibits little or no reflective properties. Measurement involves the analysis of light reflected from the film, and if the film exhibits excessive specular reflection the instrument may be swamped with reflected light owing to the fact that both the incident and the reflected light travel at near-perpendicular angle to the film.

Photosensitive compounds such as photochromic compounds are expensive materials. It is both economic and technically efficient to confine application of the photosensitive compound by applying the coating containing the photosensitive compound in the form of spots corresponding to the holes in the mask. The diameter of the spots is preferably larger than the diameter of the holes for maximum efficiency of light capture and to allow some latitude in registration.

The coating may comprise a small amount, for example 0.5 to 2% by weight, of a non-photosensitive light-absorbing compound. This has the advantage that the spots can be

recognised instrumentally by spectral measurement at a fixed wavelength corresponding to an absorption peak of the non-photosensitive compound, irrespective of the current colour of the photosensitive compound. If this compound absorbs visible light, the spots can be visually recognised even when the photosensitive compound is in visually colourless form. The non-photosensitive compound should be of low absorbance at wavelengths at which the photosensitive compound is of high absorbance in either isomeric state.

The invention is illustrated by the following Example, in which parts and proportions are by weight except where otherwise specified:-

Example

A coating composition was prepared by dissolving 17.98 g Aberchrome 670 (Trade Mark of Aberchromics Limited), 1.19 g Waxoline Yellow GFW (Trade Mark of BASF AG) and 53.94 g polystyrene (Lacqrene 1810, Trade Mark of Elf Atochem) in 327.64 g 70:30 toluene/methylethylketone. The composition was applied by gravure printing to a titania-filled polyethylene terephthalate film (Melinex 365, Trade Mark of Du Pont), which had been metallised on the heatseal side. (Melinex 365 comprises a filled poly(ethylene terephthalate) film 23 micron thick coated on one side with amorphous unfilled poly(ethylene isophthalate)/poly(ethylene terephthalate) 3 micron thick as heatseal layer. The heatseal layer is not thought to be of any relevance in the present invention.) The composition was applied in the form of circular spots of about 7 mm diameter. The spots were disposed in groups of 16, comprising concentric circles of 6 spots in an inner circle and 10 spots in an outer circle, the diameter of the outer circle being about 4 cm. The groups were disposed in regular square array at a density of about 310 groups per square metre. The total coating weight in the coated areas was 1.417 g/sq.m, of which 0.354 g/sq.m was Aberchrome 670. The film was also marked with

registration marks to aid in subsequent laminating, stamping and slitting processes. On exposure to UV light (UV-A from 5 x 8W Philips Blacklight tubes), the spots turned from yellow to deep brown (colouration mode). The colour change was reversed (bleaching mode) by exposure to ambient room lighting in a short time of about 10 min.

An information storage device was made by joining together in the following order:

(1) a paper backing layer;
(2) the film described above, with its metallised surface towards the paper layer; and
(3) two layers of cardboard each 2 mm thick, perforated with 2.8 mm diameter holes corresponding to the spots on the film,

all being 40 mm diameter discs.

A similar film and device were prepared using a barium sulphate-filled poly(ethylene terephthalate) film (Melinex 329, Trade Mark of Du Pont). The instrumentally-measured difference between this device before and after exposure to a given amount of visible light was less than it was for the device containing the titania-filled film.

In a comparative experiment was tested an acetate film containing Aberchrome 670 in solid solution. The bleaching rate was slow in comparison with either of the filled films. It is thought that this was because the absence of a reflective backing resulted in less efficient photon capture.

The specular and diffuse reflective properties of poly(ethylene terephthalate) films filled with titania and with barium sulphate were measured using a Perkin-Elmer Lambda 9 (Trade Mark) UV-visible-NIR spectrophotometer equipped with an integrating sphere for reflectance

measurement and an optional light trap for removal of the specularly-reflected component. The results were expressed as percentages of the reflectivity of a standard barium sulphate plate supplied by Perkin-Elmer. The relative amounts of specular and diffuse reflection were similar over the range from about 420 to 700 nm, although the total amount of reflection declined steadily with increasing wavelength. The following results were obtained at 560 nm:

Filler	Diffuse reflection%	Specular reflection %
Titania	85	2.5
Barium sulphate	83.5	5

CLAIMS

1. A plastics film filled with a filler and having diffuse reflective properties, the film bearing a coating which contains a photosensitive organic compound.

2. A film as claimed in claim 1, wherein the photosensitive organic compound is a photochromic compound.

3. A film as claimed in claim 2, wherein the photochromic compound is a fulgide or diarylethene.

4. A film as claimed in any of claims 1 to 3, wherein the photosensitive organic compound is dispersed at molecular level in a coating of a polymer which is compatible with the compound but does not reach with it nor cause it to crystallise nor substantially absorb light of wavelengths to which the photosensitive compound is sensitive.

5. A film as claimed in claim 4, wherein the polymer is polystyrene.

6. A film as claimed in any of claims 1 to 5, which bears the coating containing a photosensitive organic compound on one side and is metallised on its reverse side.

7. A film as claimed in any of claims 1 to 6, wherein the filler is a white pigment.

8. A film as claimed in any of claims 1 to 7, which has a diffuse reflectivity of at least 85% and a specular reflectivity of no more than 3%, based on the reflectivity of a standard barium sulphate plate.

9. A film as claimed in any of claims 1 to 8, containing from 0.5 to 2% by weight based on the coating of

a non-photosensitive, light-absorbing compound.

10. An information storage device which comprises in combination a film according to any of claims 1 to 9 and a perforated mask disposed on the coating-bearing side of the film.

11. An information storage device as claimed in claim 10, wherein the mask is perforated with holes of diameter 1 to 5mm and has a thickness of 0.5 to 2.5 times the diameter of the holes.

ABSTRACT

A plastics film is provided which is filled with a filler, has diffuse reflective properties and is coated with a coating containing a photosensitive organic compound. The film is useful in the production of information storage devices by combining it with a perforated mask disposed on the side of the film which bears the coating.

Practitioner's Docket No. _____ ***PATENT***

COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL, CONTINUATION, OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

- ☐ original.
- ☐ design.
- ☐ supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

- ☒ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

NOTE: See 37 C.F.R. § 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the inventors named in the prior application.

- ☐ divisional.
- ☐ continuation.

NOTE: Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. § 1.53(b) (application filing requirements — nonprovisional application).

- ☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor *(if only one name is listed below)* or an original, first and joint inventor *(if plural names are listed below)* of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

PHOTOSENSITIVE PLASTICS FILMS AND INFORMATION STORAGE DEVICES

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) ☑ is attached hereto.

NOTE: *"The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:*

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed; or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) ☐ was filed on ____________, as ☐ Serial No. 0 /__________
or ☐ ____________________
and was amended on ____________ *(if applicable)*.

NOTE: *Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.*

NOTE: *"The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:*

"(1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g., 08/123,456);

"(2) name of inventor(s), serial number and filing date;

"(3) name of inventor(s) and attorney docket number which was on the specification as filed;

"(4) name of inventor(s), title which was on the specification as filed and filing date;

"(5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or

"(6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."

Notice of July 13, 1995 (1177 O.G. 60), M.P.E.P. § 601.01(a), 6th ed., rev. 3.

(c) ☒ was described and claimed in PCT International Application No. GB99/03097, filed on 17.09.99 and as amended under PCT Article 19 on ____________ *(if any)*.

SUPPLEMENTAL DECLARATION (37 C.F.R. § 1.67(b))

(complete the following where a supplemental declaration is being submitted)

☐ I hereby declare that the subject matter of the

☐ attached amendment

☐ amendment filed on _____

was part of my/our invention and was invented before the filing date of the original application, above-identified, for such invention.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

☐ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. §§ 119(a)-(d))

NOTE: "The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other situations, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate." 37 C.F.R. § 1.55(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) ☐ no such applications have been filed.

(e) ☒ such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
GB	9820317.7	18.09.98.	☒ YES NO ☐
			☐ YES NO ☐
			☐ YES NO ☐
			☐ YES NO ☐
			☐ YES NO ☐

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE
_____ /_____	_____
_____ /_____	_____
_____ /_____	_____

CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S) UNDER 35 U.S.C. 120

☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN PART (C-I-P) APPLICATION.

ALL FOREIGN APPLICATION(S), *IF ANY*, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

_____

_____

_____

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

6 — Stanley B. Kita, Registration No. 24,561; George A. SMITH, Jr., Registration No. 24,442; Wilson OBERDORFER, Registration No.17,379; Mary E. BAK, Registration No. 31,215; Henry HANSEN, Registration No. 19,612 and Cathy Ann KODROFF, Registration No. 33,980

(check the following item, if applicable)

☐ I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

☒ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO	DIRECT TELEPHONE CALLS TO: *(Name and telephone number)*
☐ Address	
HOWSON AND HOWSON Spring House, Corporate Center, P.O. Box 457, Spring House, Pennsylvania 19477	(215) 540-9200
☐ Customer Number _____	

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor

1-00

Michael (GIVEN NAME) _____ (MIDDLE INITIAL OR NAME) HAWKINS (FAMILY (OR LAST NAME))

Inventor's signature M. Hawkins

Date 8th March 2001 **Country of Citizenship** United Kingdom

Residence Frodsham, United Kingdom GBX

Post Office Address 2 Highbank Road, Kingsley, Frodsham, Cheshire WA6 8AD, United Kingdom

Full name of second joint inventor, if any

2-00

David (GIVEN NAME) Michael (MIDDLE INITIAL OR NAME) NEWBITT (FAMILY (OR LAST NAME))

Inventor's signature [signature]

Date 8 Mar 01 **Country of Citizenship** United Kingdom

Residence Southampton, United Kingdom GBX

Post Office Address 15 Hann Road, Rownhams, Southampton SO16 8LN, United Kingdom

Full name of third joint inventor, if any

(GIVEN NAME) (MIDDLE INITIAL OR NAME) (FAMILY (OR LAST NAME))

Inventor's signature _____

Date _____ **Country of Citizenship** _____

Residence _____

Post Office Address _____

(check proper box(es) for any of the following added page(s) that form a part of this declaration)

☐ **Signature** for fourth and subsequent joint inventors. *Number of pages added* ______.

* * *

☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* ______.

* * *

☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. *Number of pages added* ______

* * *

☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

* * *

☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added ______

* * *

☒ Authorization of practitioner(s) to accept and follow instructions from representative.

* * *

(if no further pages form a part of this Declaration, then end this Declaration with this page and check the following item)

☐ This declaration ends with this page.

ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR AUTHORIZATION OF ATTORNEY(S) TO ACCEPT AND FOLLOW INSTRUCTIONS FROM REPRESENTATIVE

The undersigned to this declaration and power of attorney hereby authorizes the U.S. attorney(s) named herein to accept and follow instructions from

JY & GW Johnson

Name(s) of authorized representative(s)

Kingsbourne House,

Address

229-231 High Holborn,

London WC1V 7DP ENGLAND

as to any actions to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney(s) and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. attorney(s) will be so notified by the undersigned.

(Added page to Combined Declaration and Power of Attorney for authorization of attorney(s) to accept and follow instructions from representative [1-24])